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Psychological Health Before, During, and After an Economic Crisis:

Results from Indonesia, 1993 – 2000

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Abstract

The 1997 Indonesian financial crisis resulted in severe economic dislocation and political upheaval, and the detrimental consequences for economic welfare, physical health, and child education have been previously established in numerous studies. We also find the crisis adversely impacted population psychological well-being. We document substantial increases in several different dimensions of psychological distress among male and female adults across the entire age distribution over the crisis period. In addition, the imprint of the crisis can be seen in the differential impacts of the crisis on low education groups, the rural landless, and residents in those provinces that were hit hardest by the crisis. Elevated levels of psychological distress persist even after indicators of economic well-being such as household consumption had returned to pre-crisis levels suggesting long-term deleterious effects of the crisis on the psychological well-being of the Indonesian population.

This paper—a product of the Poverty Team, Development Research Group—is part of a larger effort in the department to explore the welfare impacts of economic shocks. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at jfriedman@worldbank.org.

Psychological Health Before, During, and After an Economic Crisis: Results from Indonesia, 1993 – 2000

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Introduction

The 1997 Asian currency crisis, arguably one of the most disruptive global economic events in several decades, caused severe economic damage across much of East and Southeast Asia. No country was more affected than Indonesia. After several decades of sustained economic growth with low inflation, a stable exchange rate and three decades of President Suharto in power, Indonesian society was torn apart by the 1997 crisis. The Indonesian rupiah collapsed, falling from around Rp 2,500 per US$ in late 1997 to Rp 15,000 per US$ in mid 1998. GDP declined 12 percent in 1998 and the economy did not grow again until 2000. Prices spiraled up with inflation in 1998 reaching 80% while food prices increased by 160%. Economic upheaval was accompanied by political turmoil. President Suharto resigned after street protests in early 1998 which presaged historic changes in the system of national and local government. The vast majority of Indonesian households struggled to cope with both the immediate economic adversities they faced at the onset of the crisis as well as tremendous uncertainty over their economic, social, and political futures. Living through the stresses of the crisis potentially took a substantial toll on the psychological well-being of the population. This project examines the evidence and seeks to identify those subgroups of the Indonesian population who paid the highest price in terms of their psychological and psychological health.

The impacts of the crisis on economic well-being were far from uniform. In many ways the crisis was centered in urban areas and disadvantaged urban households bore the brunt of the crisis (Frankenberg et al., 1999; Friedman and Levinsohn, 2002). Household consumption declines and increases in poverty rates were much greater in urban areas than in rural areas.[1] In large part, this is a reflection of the rise in the relative price of food, particularly rice, which benefited net food producers and the concomitant collapse of real wages which took its toll on urban workers and the rural landless. The economic impacts of the crisis also varied dramatically across the 27 Indonesian provinces and numerous island groups even within urban and rural areas (Levinsohn et al., 2003). More urbanized provinces in Java, such as Jakarta and West Java, suffered the largest contractions whereas the deleterious economic effects of the crisis were substantially more muted in those provinces that produced exports and export-related services such as tourism (in Bali, for example) and the production of oil, timber, and fishing (on Sumatra). Variation across provinces and between rural and urban areas is a fundamental aspect of Indonesia's economic crisis and is important for understanding how the economic crisis affected psychological well-being.

A series of studies have described the effects of the crisis on multiple dimensions of the economic well-being and physical health of the Indonesian population. Taken together, those studies indicate a

[1] Household per capita expenditure declined 34% among urban households and 13% among rural households (Frankenberg et al., 1999). Poverty rates more than doubled in urban areas and rose about 50% in rural areas (Suryahadi et al. 2000).

dramatic but short-lived decline in the living standards of most Indonesians suggesting an enormously resilient population that took great efforts to weather the storm.[2]

In sharp contrast, the impact of the financial crisis on psychological and mental health has not been explored. The goal of this paper is to provide empirical evidence on the extent to which the manifold upheavals and associated stresses of the Indonesian crisis affected the psychological health of the Indonesian population and whether any such effects were long-lasting. In so doing, we contribute new evidence on the psycho-social costs of economic insecurity in developing countries.

Using data from the Indonesia Family Life Survey, we track indicators of psychological distress of the same individuals who were assessed in up to three interviews over a period before, during and after the onset of the crisis. This evidence is contrasted with changes in general health status of the same individuals. We find there are substantively large and significant increases in the prevalence of psychological distress among both male and female adults after the onset of the crisis and this increase persists well beyond the beginning of the crisis. While the effects are apparent across the entire age range, there is a suggestion that older adults are slightly more vulnerable to elevated distress. We also find levels of anxiety are higher after the onset of the crisis among those with less education. The impact of the crisis is also greatest among the rural landless and those who were living in provinces that suffered the greatest toll in terms of the economic costs of the crisis.

Psychological health in developing countries

Although it is generally recognized that psychological health is an important component of individual well-being, there is limited evidence at a population level regarding the prevalence of psycho-social disability in developing countries or its variation within those countries. Over and above the direct consequences on human welfare of poor psychological health, the literature suggests there may be significant economic costs, both for the individual and society at large. Global Burden of Disease estimates indicate that neuro-psychiatric diseases account for about 10% of the total burden of disease and injury (measured in disability-adjusted life years) in low and middle income countries and over 12% of the disease burden in East Asia and the Pacific. About one-third of that diseases burden is attributed to depression. (Lopez et al. 2006). Other leading contributors to the global disease burden that are associated with psychological health include schizophrenia, bipolar disorder and substance abuse.[3]

[2]Studies have described the impact of the crisis on of poverty, consumption and wealth, labor supply, wages and earnings, schooling, physical health and health care utilization (Frankenberg et al. 1999; Suryahadi et al. 2000; Frankenberg et al. 2003; Thomas et al. 2004; Strauss et al., 2004).

[3] As will be discussed in detail later in the paper, our measures of psychological health are designed to assess overall psycho-social well-being and not specific manifestations of mental illness. While the majority of studies cited are more clinical in nature and hence measure specific classifications of mental illness our results pertain to a generalized notion of psychological health. Specific mental illnesses, such as bipolar depression or generalized anxiety disorder, are subsumed in this general category of psychological distress or ill psychological health.

Studies in both developed and developing countries suggest psychological health problems tend to be more prevalent among those with lower socio-economic status although it has been a challenge to pin down the causal mechanisms that underlie these associations. It is likely that economic insecurity and poverty contributes to poor psychological health and, conversely, the evidence suggests that people suffering from psychological health problems tend to perform less well in the labor market and in school (Ettner et al. 1997; Dooley et al. 2000, Kessler et al. 1995). Health care service providers across the globe report that depression and anxiety are more prevalent among lower educated groups (Goldberg and LeCrubier, 1995; Patel and Kleinman, 2003). Poorer and more disadvantaged groups typically have little or no access to psychological health care services, especially in the developing world, thus potentially exacerbating the circular relationship of poverty and mental illness (Saraceno and Barbui, 1997).

Emerging research indicates that it is not necessarily poverty itself but adverse changes in socio-economic status that are predictive of psychological stress (Das et al., 2007). If that is correct, the transitions, dislocations and uncertainties that are part of daily life for many people living in the developing world today are likely to carry with them an elevated burden of psycho-social health problems. Indeed, even as the physical health of a population improves, the same development process may lead to elevated social and psychological pathologies as societies undergo pronounced changes such as rapid urbanization, which tend to weaken traditional rural social bonds (Sugar et al., 1991). It has been suggested that the highest levels of psychological pathologies are found in countries emerging from conflict, where levels of post-traumatic stress disorder (PTSD) are high among the general population (Joop et al., 2001). Populations in regions that have suffered from natural disaster also suffer significantly more psychological distress in terms of depression, somatization, and anxiety (Wang et al., 2000; Frankenberg et al., 2007). Given this evidence, it is plausible to suppose that severe economic dislocation may have adverse effects on health in general and psychological health in particular. Tangcharoensathien et al. (2000) provide some evidence on the immediate aftermath of the 1997 financial crisis in Thailand. Although the overall impacts on physical and psychological health in this specialized study sample are mixed, the reported prevalence of severe stress, suicidal ideation, and hopeless feelings increased substantially among the sub-group of unemployed. The Thai crisis was not as deep, far-reaching, or long-lasting as the Indonesian crisis and so the impact of the Indonesian crisis on the psychological well-being of the population may have been more widespread. We turn now to assess that evidence.

The data

The Indonesia Family Life Survey (IFLS) is an on-going multi-purpose individual-, household- and community-level longitudinal survey. The first wave of IFLS was fielded in 1993 and collected information on over 30,000 individuals living in 7,200 households. The original sample covered 321 communities in 13 provinces and is representative of the population residing in those provinces, about 83% of the national population. The same respondents were re-interviewed in 1997 (IFLS2), a few

months before the beginning of Indonesia's currency crisis, and again in 2000 (IFLS3). A 25% sub-sample of individuals was re-interviewed in 1998 (IFLS2+) in order to measure the immediate impacts of the crisis.[4]

In addition to collecting extensive information on the socio-economic and demographic characteristics of respondents and their families, IFLS assesses the psychological well-being of its respondents using an interview-based survey instrument. The measurement of psychological health in this way has a long history in the mental health research community and several survey tools, both for diagnostic and screening purposes, have been developed over the past decades. Some of these efforts have resulted in extensive diagnostic assessments such as the Composite International Diagnostic Interview (CIDI) which use a battery of a small number of screener questions that feed into a more extensive sub-questionnaire pertaining to specific psychological pathologies. An alternative assessment of psychological health through survey is the brief screening scale typically developed to assess population-level prevalence in non-specific psychological distress. One example of such a scale can be found in Kessler et al. (2002) who present a method for developing a new 10-question screening scale of psychological distress for the National Health Interview Survey (NHIS).

While these survey tools have been developed to study the populations of developed countries, a recent WHO consortium (2000) using the CIDI has compiled a cross-national study of the prevalence and correlates of psychological disorder including samples from Brazil, Mexico, and Turkey. They find that the prevalence of disorders such as depression or anxiety is widespread throughout the world. While it is generally difficult to import these survey tools wholesale into a developing country setting, many researchers have translated and adapted the tools specifically for the local context. Recent locally-rooted studies in the developing world have found the prevalence of several psychological disorders to be as high as or higher than those found in the west. Almeida-Filho and others (1997) find the overall prevalence patterns by age and gender of DSM-III psychiatric diagnoses in 3 urban centers in Brazil to be similar to those found in the US Epidemiological Catchment Area studies (based on results cited in Robins and Regier, 1991). In rural Ethiopia the prevalence of psychiatric morbidity is quite high and similar to levels found in urbanized, developed countries (Awas et al. 1999). Using locally developed screening tools, Abas and Broadhead (1997) find a depression and anxiety prevalence of 31% among women living in a Harare slum – a higher prevalence than that found for the same demographic category in London. In general, developing country based studies find that the same covariates of psychological illness and psychological distress observed in developed countries – female gender, low income, older age, and lower

[4] Considerable attention has been placed on minimizing attrition in IFLS. In each re-survey, about 95% of households have been re-contacted, thus minimizing data concerns that can arise from selective attrition. Around 10-15% of households moved from the location in which they were interviewed in the previous wave and concerted effort was made to track these households to their new location. In addition, individuals who moved out of their original IFLS household have been followed. This has added around 1,000 households to the sample in 1997 and about 3,000 households in 2000.

education – are also associated with common psychological disorders in low and middle income countries (Patel et al. 1999; Patel and Kleinman, 2003).[5]

To measure psychological well-being in Indonesia, IFLS adopted a short screening survey of psychological distress. The psychological health component of IFLS is not intended to diagnose a specific psychological illness *per se*, but rather to assess the population prevalence of various symptoms of psychological distress. These symptoms are typically highly correlated with specific forms of psychological illness. The particular IFLS psychological health questions are adapted from the General Health Questionnaire (GHQ) and attempt to measure symptoms of two globally common categories of psychiatric disorder- depression and anxiety (Goldberg, 1972). Appendix Table 1 presents the IFLS questions used in this study. They focus on general feelings of sadness or anxiety as well as specific symptoms of distress.[6] These questions have been translated and back-translated to ensure accuracy, as well as extensively tested in the field in order to ensure comprehension among study subjects. Appendix Table 1 also includes a question on self-perceived general health status. This standard health survey question is a summary measure of health that encompasses physical and non-physical domains of well-being. It provides a contrast with which to compare our markers of psycho-social well-being against a broader summary of health.

In terms of survey implementation, the psychological health questions were assessed in full in the 1993 and 1998 survey waves and a subset of the questions were assessed in the 2000 wave. (The subset is marked with an asterisk in Appendix Figure 1). For much of the following analysis, we exploit the panel nature of the data to contrast the general psychological health of each individual at two points in time, 1993 and 2000 (the 1998 results from the 25% sub-sample will also be used).

This seven year period brackets the financial, political and social crisis which, given its magnitude, is likely the dominant factor underlying changes in psychological health over this period. An advantage of using 1993 for comparison is that our estimates will not be contaminated by the impact of expectations regarding an impending crisis.

Psychological distress, pre- and post-crisis

We begin with an overview of our psychological well-being indicators before and after the onset of the 1997 crisis. Table 1 reports the overall prevalence of psychological distress in the population of

[5] More recent research (Das et al., 2007) fails to find this coincident relationship between psychological health and low socio-economic status in five developing countries, although it does replicate the earlier findings in regards to demographic correlates.

[6] The questions ask about a broader array of symptoms than that indicated by the DSM-IV and, although questions relate to symptoms of depression and anxiety, the prevalence of a symptom or multiple symptoms within an individual are not sufficient information to produce a diagnosis (Bir and Frank, 2001). Although validation studies with the US based GHQ have concluded that if a clustering of symptoms within an individual is identified, psychiatrists are likely to make a diagnosis (Goldberg, 1972), the IFLS data do not provide diagnostic information and we interpret out measures as indicative of general psychological well-being in the population.

adults age 20 and above at the time of each wave of the survey along with the percentage of respondents who report they were in poor general health status.[7] The upper panel reports results for males and the lower panel for females. The left hand panel reports estimates that draw on reports from all respondents in each wave of the survey. The estimates are weighted so that they are representative of the underlying population.[8]

The onset of the 1997 crisis was accompanied by a dramatic increase in all of the psychological distress indicators measured in IFLS. For both males and females, between 1993 and 1998, the prevalence of distress almost doubled for each indicator except one, difficulty sleeping, which increased by about 50%. For example, in 1993, about 12% of men reported feeling sad in the prior four weeks; in 1998, nearly 30% of men reported feeling sad. Women were slightly more likely to feel sad in 1993 (16%) and much more likely to feel sad in 1998 (41%). There were even larger proportionate increases in the prevalence of anxiety which rose three- to four-fold (from a lower base). Combining both markers into an index identifying those who report feeling either sad or anxious, about one in six respondents reported such feelings in 1993. In 1998, one in three males and almost one of every two females reported these feelings. In 1993, one in five respondents had difficulty sleeping and by 1998 this affected one in three adults. The prevalence of fatigue nearly doubled and short temper more than doubled. For both males and females, the prevalence of reported somatic pain tripled from around 20% to 60% of respondents.

The increase in prevalence of psychological problems between 1993 and 1998 suggests a substantial rise in underlying psychological and emotional distress over this period which, as shown in the third column of the table, persisted well beyond the onset of the crisis. There is only a small decline in the prevalence of psychological distress between 1998 and 2000 for both men and women. This persistence is noteworthy since by 2000 the Indonesian economy had begun to recover and mean household consumption levels had already returned to the pre-crisis levels of 1997. (Ravallion and Lokshin, 2007)

In contrast with the increase in psychological problems, self-reported general health status changes very little over the entire seven year period. Around 11% of males and between 11 and 14% of females reports themselves as being in poor health. The relative stability of this general health measure suggests that the psychological distress indicators identify a change in a different dimension of health and

[7] For ease of exposition, we have dichotomized the psychological distress and general health status questions. We combine respondents that report the experience of a particular psychological distress indicator either often or sometimes over the past four weeks. Likewise if a respondent reported their general health status as 'somewhat unhealthy' or 'very unhealthy' we recode to being in 'poor general health'. One approach to measurement of health problems with survey data is to aggregate responses to several questions and create a summary index (see Das et al., forthcoming, for an example in psychological health). We present results for two domains of psychological problems – feeling sad or anxious – and suffering from sleep difficulties. Those are the only questions that are repeated across all three survey waves. Our results are qualitatively unchanged if we combine all six questions into an index and compare 1993 with 1998 or if we combine the three common questions across the three surveys into an index and compare 1993 with 1998 and 2000.

[8] The sample sizes vary across the waves because of the survey design. In 1993, a subsample of adults was interviewed in each household. In 1998 and 2000, all adults were individually interviewed. The 1998 wave was restricted to a 25% sub-sample of households for cost reasons.

well-being than general health and that the crisis differentially affected these separate dimensions. In the subsequent analysis, general physical health status results will provide a useful comparison with psychological health indicators and emphasize the potentially unique impacts of the crisis on psychological well-being.

The analyses thus far provide evidence on the prevalence of health problems in the population. It is useful to explore transitions in health over this period which requires following the same individual over time. The right hand panel of Table 1 reports the prevalence of psychological problems and poor general health among respondents who were individually assessed in both 1993 and 2000 and were age at least 20 in the 1993 baseline. Over 80% of the 1993 respondents were also interviewed in 2000. Comparing prevalence rates for the population (in the first column) with the rates for the panel sample at baseline (in the fourth column) provides insights into the representativeness of the panel sample. For both males and females, the prevalence rates in 1993 are very similar across the columns. The rates in 2000 are not directly comparable in the cross-section and panel samples because the respondents are seven years older in the latter. For the psychological indicators, the rates are close. Thus the panel sample replicates the large increase in psychological distress between 1993 and 2000 that was observed in the cross-section sample. In contrast, in the panel sample, a larger fraction of respondents report themselves as being in poor health relative to the cross-section sample. This is largely a reflection the fact that poor health rises with age and provides further evidence that time effects are minor relative to age effects in the case of general health status.

To explore the variation in psychological distress over the life course, Figure 1 provides non-parametric estimates of the relationship between reporting either sadness or anxiety and age for males (in the upper panel) and females (in the lower panel). The relationships are estimated separately for the three waves of IFLS with the cross-section samples using locally weighted smoother scatter plots (Cleveland & Devlin, 1988). The prevalence of sadness or anxiety varies little with age although prevalence rates are higher among younger and older males in 1998 and 2000 and among older females in 1998. These modest age differences are dwarfed by the dramatic shift upwards in the entire profile between 1993 and 1998. At every age, the prevalence of sadness or anxiety approximately doubled between 1993 and 1998 indicating a profound increase in psychological distress for adults across the entire age distribution. The estimates for 1998 and 2000 are nearly co-incident indicating persistence of crisis effects on psychological health across all ages, even as the Indonesian economy had begun to recover.

These results in Figure 1 stand in contrast to those in Figure 2, which present the same non-parametric analysis this time for general health status. A clearer age gradient is readily observed in Figure 2 – as respondents age they are more likely to report poor general health. This result, consistent with the broader empirical literature, highlights the different domains of well-being identified by GHS and by the psychological health questions. Another difference concerns the relative lack change in the GHS measure over the 1993-2000 period. There does appear to be an increase in reported poor general health in 1998 in

comparison to 1993, although one not close to the magnitude witnessed for the psychological distress measures. Yet a third difference is a decline in poor GHS for middle-aged and older respondents between 1998 and 2000 while psychological distress remains at elevated levels. Understanding the determinants of change in the GHS measure, especially the flattening of the age gradient from 1993 – 2000, lies beyond the focus of this paper. What is clear is that the general and sustained rise in the population's psychological distress is not mirrored by changes in the population's perceived general health.

Individual transitions in psychological distress and the crisis

We turn next to an investigation of the transitions into and out of psychological distress exploiting the repeat observation dimension of the panel data to examine changes in well-being of the same individuals over time. Table 2 summarizes the results for transitions between 1993 and 2000. For each measure of psychological distress, the percentage of people in each of four possible categories is listed – those who report psychological distress in both survey years, those who report no distress in either year, those who transit into distress and those who transit out of distress.

As is apparent in the aggregate data, a substantial fraction of males and females have transitioned into being psychologically distressed during this period. However, over half the population – and in some cases three-quarters – had no transitions with the vast majority of these people never reporting that they felt psychological distress. A small but significant fraction of the population moved out of feeling distressed during this period. For example, among the 12% of males who felt sad in 1993, over half did not feel sad in 2000. Among the 17% of women who felt sad, half did not feel sad in 2000. At the same time, about 20% of males and 30% of females moved from not feeling sad in 1993 to feeling sad in 2000. The patterns are broadly similar for the other indicators of psychological well-being.[9] Females are more likely to transition into and out of distress and, in general, the fraction of the population that transitions into psychological distress during this period is between 2 and 5 times greater than the fraction that transitioned out of distress. In contrast with the psychological indicators, relatively few people transition into poor health and around two-thirds of those who were in poor health in 1993 report they are not in poor health in 2000.

Psychological distress and individual characteristics

The combination of measures of psychological well-being along with demographic and socio-economic characteristics of individuals collected in IFLS between 1993 and 2000 provides unique opportunities to identify those sub-groups of the population who are at elevated risk of suffering from

[9] The patterns are also similar for transitions in the 25% sub-sample over the 1993 – 1998 period. When looking at the 1998 – 2000 period, the relative persistence of distress in contrast to either the 1993 – 2000 or 1993 – 1998 period is clear. The ratio of those individuals reporting distress in both 1998 and 2000 vis a vis those who transit out of a distressed state is higher than the same ratio calculated for the periods that span the crisis.

psychological distress. We use multivariate regression to identify those at greatest risk before and after the onset of the crisis as well as those people who are most likely to transitioning into or out of psychological distress.

We focus on the role of age, education and religion (all of which are measured in 1993) while controlling gender in the models. Not all changes between 1993 and 2000 can be attributed to the 1997 crisis. We therefore also exploit the fact that the impact of the 1997 crisis differed dramatically across the Indonesian archipelago and relate differences in responses to the crisis to a measure of the magnitude of the crisis for the area in which each respondent was living in 1993. Specifically, we distinguish not only province of residence but also those living in urban areas, the rural landed and rural landless households because research on the crisis has demonstrated that the impact of the crisis differed substantially between those who were net food producers and those who were net food consumers. Under the plausible assumption that the crisis was unanticipated in 1993, the impact of location of residence in 1993 on psychological distress can be interpreted as capturing impacts that are unrelated to responses to the crisis.[10]

Regression results are reported in Table 3 for three indicators of psychological distress, sadness, anxiety, and difficulty sleeping, and also for poor general health using the sample of respondents who were age 20 in 1993 and interviewed in both 1993 and 2000. Columns 1 and 2 in each block examine the correlates associated with psychological distress or poor health in 1993 and 2000, respectively. We report odds ratios from logistic regressions with the dependent variable being unity if the respondent reports being in poor psychological or physical health. Columns 3, 4 and 5 in each block report the results of the transition models which are estimated by multinomial logistic regression. We report risk ratios relative to not being in poor psychological or physical health in either 1993 or 2000. Standard errors take into account correlations of unobserved factors that are common within households. The table presents results for gender, age, education, and rural/urban location. Differences by province are summarized in Figure 2.[11]

[10] The data affords a broader set of socio-economic controls than those included in these parsimonious specifications. We do not include measures of individual work (and therefore earnings) because they may be determined in part by contemporaneous psycho-social well-being (Ettner et al., 1997; Dooley et al., 2000) The same reasoning applies to measures of household resources such per capita expenditures, which is the combination of earnings (and other income) of each individual and the choice of living arrangements which may both influence and be influenced by psychological health. We assume the included socio-economic factors such as educational attainment, location of residence, and ownership of land are largely fixed before psycho-social well-being in 1993 is determined.

[11] Religion is an important characteristic that may condition the experience and reporting of psychological distress indicators and is also mostly fixed over the crisis period. Indeed the multivariate analysis finds important differences in reported psychological well-being across Indonesia's major religious groups – Muslim, Christian, and Hindu. It is difficult to understand exactly how religion affects the interpretation and expression of states of psychological distress, and indeed this task is beyond the scope of this paper. Nevertheless we include religion in our multivariate framework because of the revealed influence on our psychological distress indicators. If we exclude religion from the analysis, the coefficients on the other covariates are largely unchanged with the exception of the Bali province coefficient, where the vast majority of Indonesian Hindus reside.

As noted above, gender plays an important role in both the prevalence and the transitions of psychological distress controlling other characteristics. Females are significantly more likely to report being sad, anxious, suffering from sleep difficulties and being in poor general health in either survey year than are males. In addition, females are significantly more likely to transit between states of poor psychological or physical health (in either direction) and to remain in poor health in both survey years than are males.

To allow for differential response among the young and old, age is modeled as a linear spline function with a knot at 50 years of age. The influence of age varies with the particular psychological distress indicator. For example, feelings of sadness do not appear to vary by age in either survey year, although the probability of transiting from not being sad to being sad is an increasing function of age for those aged 50 and over. Age is an important determinant of changes in anxiety, particularly the most common transition from not being anxious prior to the crisis to being anxious after the onset of the crisis. For this transition, the spline function indicates a U-shaped pattern where the probability of experiencing anxiety in 2000, given no anxiety in 1993, first declines and then increases with age. These results highlight an advantage of examining transitions in psychological well-being. As shown here, and in Figure 1, there is little evidence that age is associated with the risk of being sad or anxious before or after the onset of the crisis. However, older adults are slightly but significantly more likely to transition into either state after the onset of the crisis. In terms of the other well-being measures, both sleep difficulties and poor general physical health tend to increase with age and older adults are more likely to transition into suffering from sleep difficulties or poor health.

Education, which is an indicator of socio-economic status, is measured by years of completed schooling. Better educated adults are less likely to be sad both before and after the onset of the crisis – with the latter effect being significant. The better educated are also less likely to transition into or out of feeling sad indicating that education tends to protect against swings in feelings of sadness. The pattern for sleep difficulties is essentially the same. The better educated are less likely to have difficulty sleeping after the onset of the crisis and they are less likely to experience a transition into or out of sleeping difficulties. The better educated tend to be in better general health in 1993 and 2000 and they are also less likely to experience a transition into or out of poor general health.

The relationship between education and anxiety is different. In 1993, the association is not significant. By 2000, the better educated are less likely to feel anxious. Similarly, the better educated are significantly less likely to become anxious between 1993 and 2000 and they are significantly more likely to transition from being anxious to not suffering from anxiety. Thus the crisis period witnessed a disproportionate increase in anxiety among the less educated. Studies discussed above suggest the most vulnerable groups during a crisis are the poorer and less educated groups. This is reflected in our evidence for anxiety which likely most closely reflects concerns about economic insecurity.

The last three rows of Table 3 investigate the relationship between health and sector of residence prior to the onset of the crisis. Rural dwellers who owned land in 1993 are the reference category. They are, on average, the group that was most protected from the deleterious impact of the crisis because they are net food producers and the relative price of foods rose dramatically during the crisis. Within the rural sector, the landless were substantially more vulnerable to the negative impact of the crisis since they relied on wage labor during a time when wages collapsed.

This difference in crisis vulnerability is apparent in the increasing relative likelihood of sadness and/or anxiety for the rural landless. Before the crisis, the rural landless were neither more nor less likely to report feelings of sadness or anxiety than the rural landed. Post-crisis, the landless were significantly more likely to be sad or anxious and significantly more likely to transit into sadness or anxiety. The buffer of land assets most likely protected landed households from severe income shocks and increased psychological distress.

Urban residents have a consistently higher likelihood to report sadness, anxiety, or sleep difficulties than landed rural residents before the crisis, and this is largely true after the crisis as well (with the possible exception of anxiety where urban residents still have a higher likelihood of anxious feelings, although the difference does not meet standard levels of significance). Urban residents are also more likely to transition across states of psychological distress and non-distress than their rural counterparts. Clearly, urban status influences the psychological distress indicators and constitutes an important conditioning variable, however the relative importance of urban residence in determining psychological health does not change over the crisis period, at least in relation to landed rural households.

Regional variations in psychological health transitions

Besides education or landlessness, region is another variable that mediates the severity of crisis exposure. The previously cited studies that investigate the consequences of the crisis have noted large geographic variations in crisis indicators such as inflation or declines in real household resources. That literature highlights the important role of location within Indonesia in assessing the impact of the crisis on well-being. For example provinces on the island of Java as well as southern provinces in Sumatra were among the most affected while Bali, due to it's reliance on tourism, and provinces to the east, due to the importance of resource-intensive export industries, were comparatively less affected.

The spatial pattern in the changes in psychological distress indicators largely reflects these geographic differences in crisis severity. The models reported in Table 3 include controls for province of residence in 1993 (results not shown). As expected given the previous discussion, there are pronounced differences in the psychological distress indicators by province of residence. This is the case even after controlling for education, religion, and urban/rural location. In order to provide a context for interpreting the differences in risk ratios for provinces based on the models in Table 3, we relate those effects to a measure of the impact of the financial crisis.

Results are reported in Figure 3 which relates the change in the estimated province effects between 1993 and 2000 to the proportional change in the average level of household per capita expenditure (PCE) at the province level between 1997 and 2000. The distress prevalence measure in Figure 3 is unity if the respondent reports being sad or anxious and the province effects are based on logistic regressions of the form reported in Table 3 except that the regressions are estimated separately for urban and rural households.[12]

The results show a similar pattern for rural and urban areas although the relationship is more pronounced in urban areas. Moving from left to right on the X-axis indicates higher levels of positive change in PCE and, therefore, a more mild impact of the crisis. In urban areas, for the provinces included in IFLS, Jakarta experienced a 15% decline in PCE between 1997 and 2000 whereas PCE rose in urban Bali. An increase in the Y-axis indicates an increase in sadness or anxiety.

There is a positive relationship between crisis severity and change in relative prevalence of psychological distress. Among urban areas, Jakarta, West Java, and South Kalimantan experienced the largest declines in mean income and also exhibit the largest rise in relative prevalence of sadness or anxiety. On the other end of the spectrum, Bali fared relatively well over the crisis period and also posts one of the smallest increases in overall prevalence. This general relationship between crisis severity and change in prevalence is also apparent in the fitted regression line which has a significantly negative slope (in spite of our small sample size of 13) and an R-square statistic of 0.39. While the crisis affected the psychological health of many Indonesians, those that lived in cities most affected by crisis experienced the greatest increases in distress.

Rural residents in areas most affected by crisis also experienced the greatest increases in psychological distress although the relationship is not as pronounced as that for urban residents, even after we exclude the outlier of rural Bali (where relative distress increased substantially even though mean household incomes increased by almost 25%). Rural Yogyakarta, West Java, and South Kalimantan experienced negative or zero mean income growth over the 1997-2000 period and also witnessed some of the largest increases in psychological distress. In contrast, North and West Sumatra, containing some of the fastest growing rural areas, experienced the smallest increases in relative distress. Overall the relationship between income growth and psychological distress is weaker in the rural areas than urban; indeed the slope of the rural fitted regression line is not significant at conventional levels. This is, in part, due to the fact that rural areas in general had not fared as poorly over the crisis period as urban areas had for the reasons discussed earlier.[13]

[12] The conclusions are unchanged if we look at the prevalence of sadness or anxiety separately, or pool urban and rural households.

[13] Identical analysis investigating the covariation of GHS with provincial measures of crisis impact does not find any observable relationship.

Conclusions

The 1997 financial crisis was the most disruptive socio-economic event to confront Indonesians for at least three or four decades, if not longer. The effects of the crisis were wide ranging. While some households prospered given the new opportunities afforded by rapid price changes, shifts in the structure of the economy and the political landscape, overall poverty increased and mean incomes fell. This study is the first to look at the Indonesian crisis impacts on psychological health and it does so using a high quality longitudinal socio-economic survey. We find that the severe economic dislocation and political uncertainty engendered by the crisis adversely impacted psychological health in the overall population.

We document substantial increases in distress indicators at all ages and for either gender over the crisis period. In addition, the imprint of the crisis on psychological well-being can be seen in the relatively large increase in poor psychological health for those groups most adversely affected: the less educated, the rural landless, and residents in regions hit hardest by crisis. Our analysis has focused on characteristics such as age, gender, education, and location prior to the crisis in order to avoid the difficulties associated with interpreting correlations with characteristics that might respond to the crisis. Complications associated with co-determinacy arise in many studies of the relationship between psychological health and economic outcomes such as labor force participation or income.

An additional important observation that emerges from this research concerns the persistence of psychological distress from the immediate post-crisis period in 1998 to the recovery period in 2000. By 2000, mean household consumption had already recovered to 1997 levels and the overall economy had returned to pre-crisis growth rates, however psychological distress remained at elevated levels. The finding that psychological distress persists following an economic shock while income and consumption recover suggests that psychological well-being is at least partially orthogonal to more standard measures of economic welfare.

These standard measures include at least one common measure of subjective welfare: happiness. The burgeoning literature on the economics of happiness (see Layard (2005) and Kahneman and Krueger (2006) for reviews) commonly finds that an individual's happiness measure rapidly habituates to changes in income – any change in happiness as a result of a change in income is temporary and happiness soon returns to the pre-change level. Clearly the findings here suggest, especially when considered alongside other recent work on the persistence of psychological health changes resulting from life-events (Das & Das, 2006; Stillman et al., 2006), that psychological health stands distinct from happiness and other common subjective measures and may represent an independent domain of individual welfare.

This paper presents evidence that the internal life of the Indonesian population, as measured by psychological distress indicators, suffered over the crisis period. Indeed when judged by the duration of impact, population psychological health may have been one domain of welfare most affected by the crisis and its aftermath.

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Table 1. Prevalence of psychological distress and poor heatlh

Percentage of male and female respondents report health problem

Respondents age 20 and older

MALES

Health indicator	All respondents 1993 [1]	All respondents 1998 [2]	All respondents 2000 [3]	Panel respondents 1993 [4]	Panel respondents 2000 [5]
Psychological health					
Sad	12.0	28.9	27.5	11.4	24.2
Anxious	4.6	19.7	18.4	4.6	15.5
Sad or anxious	13.8	32.7	32.4	13.5	28.6
Difficulty sleeping	18.3	31.4	27.4	18.6	28.4
Fatigue	25.5	47.2	--	25.2	--
Short temper	11.8	28.7	--	11.7	--
Somatic pain	17.4	57.9	--	17.0	--
General health status					
Poor general health	10.7	11.4	11.6	9.7	15.1
Sample size	5,629	2,928	10,128	4,598	4,598

FEMALES

Health indicator	All respondents 1993 [1]	All respondents 1998 [2]	All respondents 2000 [3]	Panel respondents 1993 [4]	Panel respondents 2000 [5]
Psychological health					
Sad	15.8	41.0	37.5	17.1	37.6
Anxious	7.3	25.9	24.4	8.5	23.6
Sad or anxious	17.9	44.1	42.7	19.9	42.2
Difficulty sleeping	22.3	35.0	32.6	23.6	35.9
Fatigue	26.3	54.0	--	28.5	--
Short temper	16.6	39.5	--	18.1	--
Somatic pain	20.1	62.0	--	21.6	--
General health status					
Poor general health	10.9	13.4	14.3	11.3	17.1
Sample size	6,892	3,222	11,271	5,957	5,957

Note: Prevalence estimates weighted to be population representative. Panel sample includes respondents age at least 20 in 1993 and interviewed in both 1993 and 2000

Table 2. Transitions in psychological well-being of panel respondents between 1993 and 2000

Percentage of respondents

All panel respondents (N = 10,524)

Instance of measure in year:			Psychological distress measure				Poor GHS
	1993	2000	Sadness	Anxiety	Sad/anxious	Diff sleep	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
No transition							
	No	No	60.4	75.3	55.2	56.3	77.0
	Yes	Yes	6.8	2.2	8.6	10.3	3.7
Transition							
	No	Yes	25.0	17.9	27.7	22.3	12.5
	Yes	No	7.9	4.6	8.5	11.1	6.9

Male panel repsondents (N = 4,586)

Instance of measure in year:			Psychological distress measure				Poor GHS
	1993	2000	Sadness	Anxiety	Sad/anxious	Diff sleep	
No transition							
	No	No	69.0	81.1	63.9	61.7	78.7
	Yes	Yes	4.6	1.2	6.0	8.6	3.5
Transition							
	No	Yes	19.6	14.4	22.5	19.7	11.6
	Yes	No	6.9	3.4	7.5	10.0	6.2

Female panel repsondents (N = 5,938)

Instance of measure in year:			Psychological distress measure				Poor GHS
	1993	2000	Sadness	Anxiety	Sad/anxious	Diff sleep	
No transition							
	No	No	53.8	70.8	48.5	52.2	75.6
	Yes	Yes	8.4	2.9	10.6	11.6	3.9
Transition							
	No	Yes	29.2	20.7	31.7	24.2	13.2
	Yes	No	8.6	5.6	9.3	11.9	7.3

Table 3. Demographic and socio-economic influences of psychological distress, cross-sectional and panel estimates.
Sample includes all male and female panel respondents age 20 and above in 1993

Select demographic/ socio-economic measures	A. Sadness					B. Anxiety				
	Cross-section association		Transitions across the two periods			Within period association		Transitions across the two periods		
	1993	2000	No - Yes	Yes - No	Yes - Yes	1993	2000	No - Yes	Yes - No	Yes - Yes
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
Male	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	--	--	--	--	--	--	--	--	--	--
Female	1.39	1.74	1.88	1.59	2.33	1.80	1.54	1.61	1.90	2.84
	(4.90)	(11.39)	(13.06)	(6.15)	(9.74)	(5.80)	(7.62)	(8.72)	(6.24)	(6.67)
Age (spline)										
20-49 years	1.00	1.01	1.00	1.01	1.00	0.99	1.00	0.99	0.99	0.98
	(1.02)	(1.49)	(0.75)	(1.13)	(0.78)	(1.18)	(0.35)	(2.00)	(1.79)	(1.88)
50 years and above	0.99	1.00	1.01	0.99	1.01	0.98	1.00	1.02	1.00	1.01
	(1.14)	(1.27)	(2.51)	(0.77)	(1.09)	(1.36)	(0.15)	(4.12)	(0.42)	(0.83)
Education (yrs of school)	0.98	0.98	0.97	0.98	0.97	1.02	0.98	0.98	1.03	1.01
	(1.82)	(3.17)	(3.74)	(2.12)	(2.57)	(1.55)	(2.94)	(3.30)	(2.25)	(0.49)
Rural landed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	--	--	--	--	--	--	--	--	--	--
Rural landless	1.03	1.17	1.19	1.03	1.22	0.86	1.15	1.17	0.88	1.30
	(0.30)	(2.18)	(2.43)	(0.23)	(1.54)	(0.95)	(1.65)	(1.92)	(0.73)	(1.11)
Urban	1.32	1.17	1.16	1.41	1.47	1.54	1.10	1.12	1.48	1.66
	(3.15)	(2.45)	(2.34)	(3.56)	(3.76)	(3.53)	(1.31)	(1.64)	(3.36)	(2.81)

Note: Odds ratio reported for logistic regression results in columns [1] and [2]. Relative risk ratios for multionmial logistic regression estimates in [3] to [5]. Asymptotic t statistics in parentheses take into account within-household correlations. Regressions include religion of respondent, household size, and province of residence in 1993. Sample size is 10,489 male and female adult respondents age at least 20 in 1993 for each regression.

Table 3 (continued). Demographic and socio-economic influences of psychological distress, cross-sectional and panel estimates. Sample includes all male and female panel respondents age 20 and above in 1993

Select demographic/ socio-economic measures	C. Difficulty sleeping					D. Poor GHS				
	Cross-section association		Transitions across the two periods			Within period association		Transitions across the two periods		
	1993 [1]	2000 [2]	No - Yes [3]	Yes - No [4]	Yes - Yes [5]	1993 [1]	2000 [2]	No - Yes [3]	Yes - No [4]	Yes - Yes [5]
Male	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	--	--	--	--	--	--	--	--	--	--
Female	1.37	1.47	1.46	1.39	1.69	1.17	1.21	1.27	1.34	1.17
	(5.42)	(7.98)	(7.51)	(5.01)	(7.40)	(1.99)	(3.00)	(3.77)	(3.51)	(1.41)
Age (spline)										
20-49 years	1.01	1.02	1.01	1.01	1.02	1.04	1.05	1.03	1.03	1.07
	(1.83)	(3.47)	(4.20)	(1.39)	(5.05)	(6.57)	(7.85)	(6.20)	(5.02)	(8.23)
50 years and above	1.00	1.01	1.01	1.00	1.02	1.04	1.00	1.05	1.05	1.05
	(0.66)	(3.91)	(2.19)	(0.23)	(3.03)	(5.42)	0.66	(7.58)	(6.17)	(6.05)
Education (yrs of school)	1.00	0.98	0.97	0.98	0.98	0.97	0.96	0.98	0.97	0.92
	(0.33)	(2.34)	(4.10)	(2.24)	(2.23)	(2.82)	(4.81)	(2.30)	(2.39)	(4.94)
Rural landed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	--	--	--	--	--	--	--	--	--	--
Rural landless	1.09	1.10	1.09	1.18	1.09	1.08	1.09	1.15	1.04	1.30
	(0.98)	-1.21	(1.12)	(1.65)	(0.79)	(0.65)	(0.95)	(1.48)	(0.34)	(1.65)
Urban	1.18	1.16	1.12	1.24	1.25	1.04	1.08	1.04	1.05	1.21
	(2.20)	(2.35)	(1.71)	(2.61)	(2.50)	(0.40)	(0.92)	(0.49)	(0.05)	(1.42)

Note: Odds ratio reported for logistic regression results in columns [1] and [2]. Relative risk ratios for multionmial logistic regression estimates in [3] to [5]. Asymptotic t statistics in parentheses take into account within-household correlations. Regressions include religion of respondent, household size, and province of residence in 1993. Sample size is 10,489 male and female adult respondents age at least 20 in 1993 for each regression.

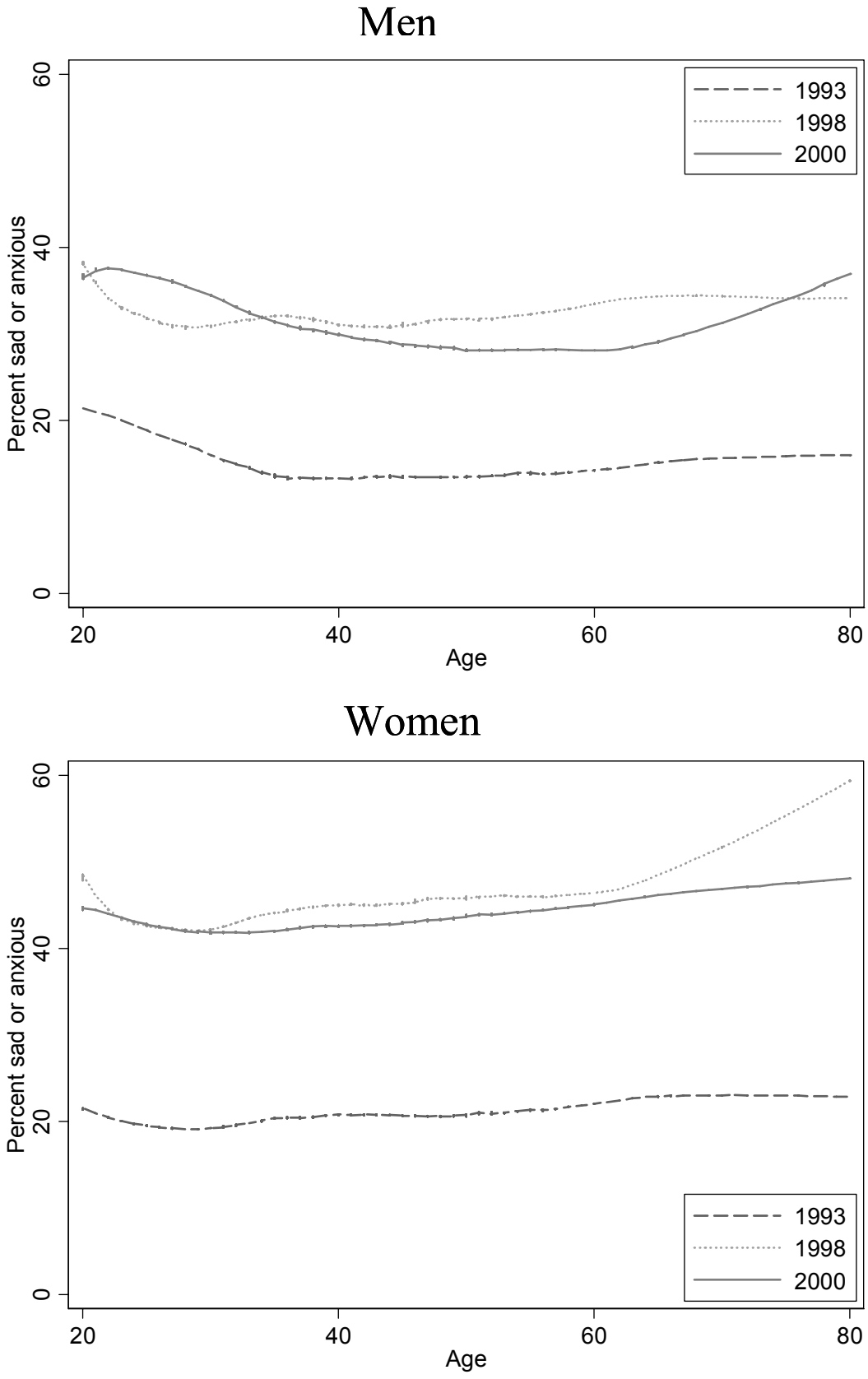

Figure 1. Incidence of sadness or anxiety in each of the three survey years, by age of respondent

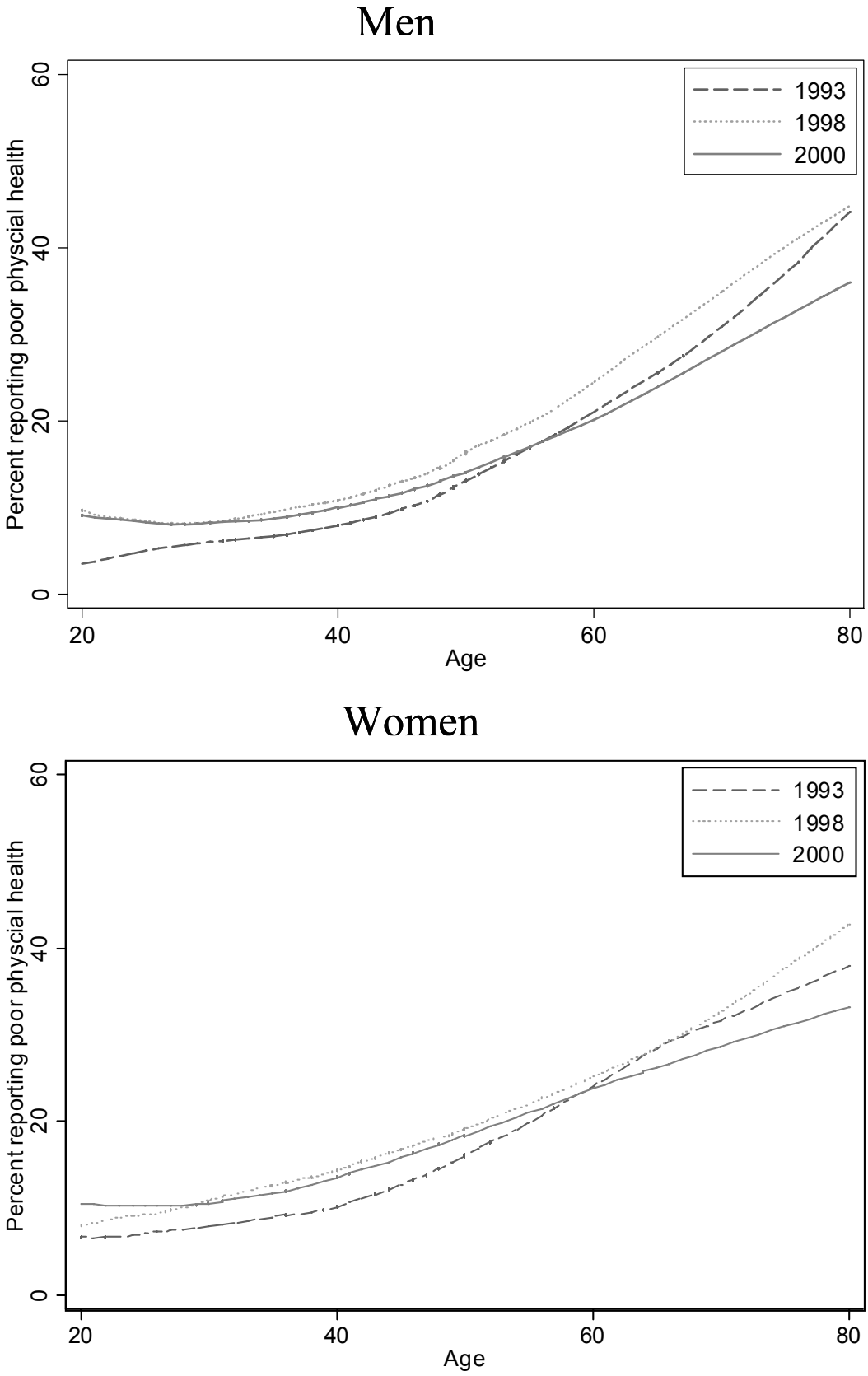

Figure 2. Incidence of poor general health in each of the three survey years, by age of respondent

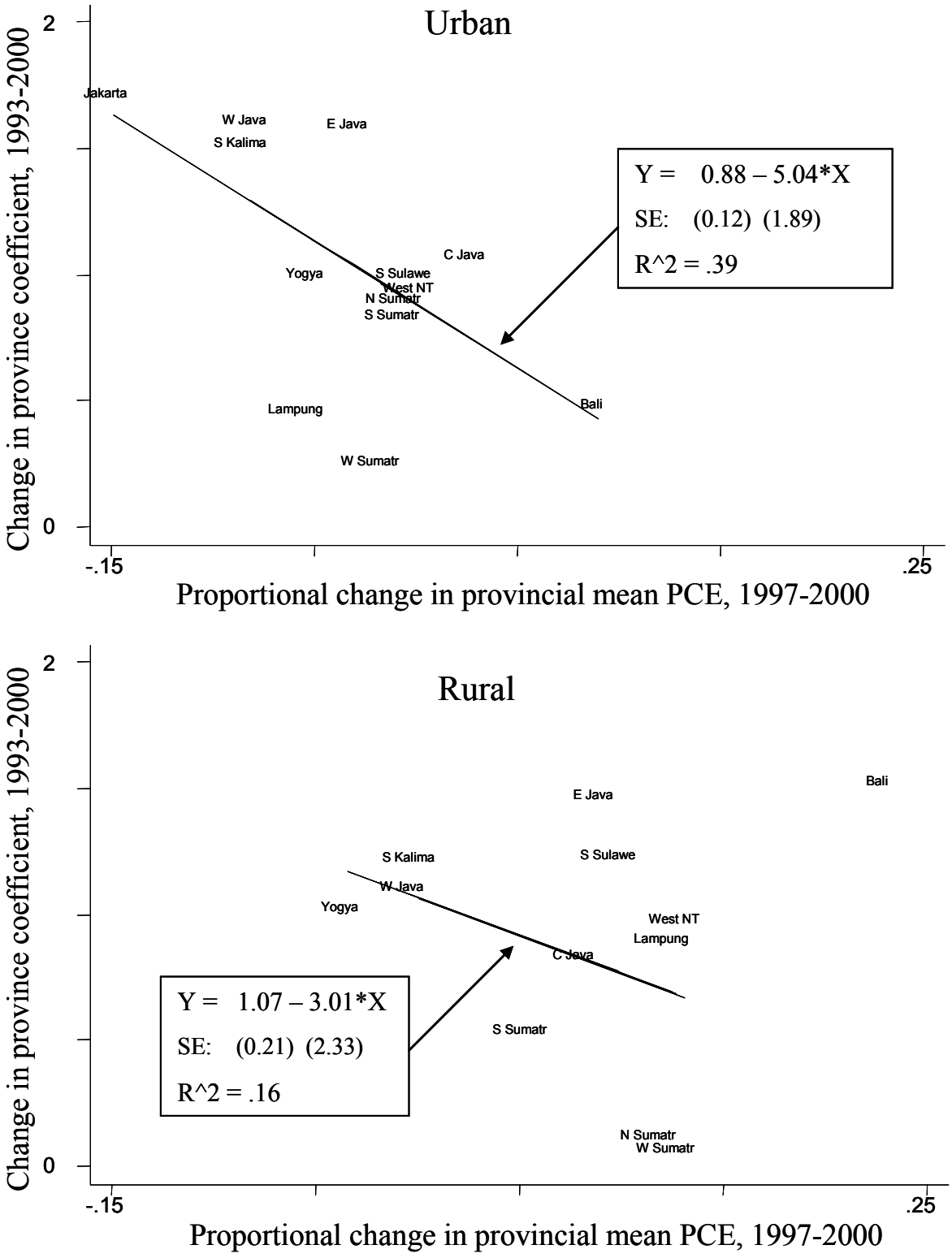

Figure 3. Scatter plots of change in province incidence of sadness or anxiety, 1993-2000, and change in province mean per capita expenditure, 1997-2000, with fitted regression line

Appendix Table 1. IFLS psychological and general physical health status questions

Indicators of Psychological distress

In the last four weeks, have you…

a. experienced sadness?	1. often	2. sometimes	3. never
b. experienced anxiety or fear?	1. often	2. sometimes	3. never
c. had a hard time sleeping?	1. often	2. sometimes	3. never
d. felt fatigue or exhaustion?*	1. often	2. sometimes	3. never
e. been short-tempered or hypersensitive?*	1. often	2. sometimes	3. never
f. felt bodily pains?*	1. often	2. sometimes	3. never

(*not asked in 2000)

Indicator of general health status

In general, how is your health?	1. very healthy	2. somewhat healthy
	3. somewhat unhealthy	4. very unhealthy